Soils within the post-2015 sustainable development agenda

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The Future we want!
The Road to 2015

March – Aug 2014: OWG shifts to recommending new goals, goals, indicators

Sept 2014: OWG submits report to UN GA

End of 2014: UNSG synthesis report of all inputs to Post-2015 process


Sept 2015 Summit: Adoption of Post-2015 Development Agenda

TRANSFORMING OUR WORLD:
THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT
Sustainable Development Goals

Goal 1. End poverty in all its forms everywhere
Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3. Ensure healthy lives and promote well-being for all at all ages
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5. Achieve gender equality and empower all women and girls
Goal 6. Ensure availability and sustainable management of water and sanitation for all
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10. Reduce inequality within and among countries
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12. Ensure sustainable consumption and production patterns
Goal 13. Take urgent action to combat climate change and its impacts*
Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17. Strengthen the means of implementation and revitalise the global partnership for sustainable development

* Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.
End poverty in all its forms everywhere
End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Ensure healthy lives and promote well-being for all at all ages
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
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Ensure availability and sustainable management of water and sanitation for all
Ensure access to affordable, reliable, sustainable and modern energy for all
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Reduce inequality within and among countries
Make cities and human settlements inclusive, safe, resilient and sustainable
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Take urgent action to combat climate change and its impacts*
Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Strengthen the means of implementation and revitalize the global partnership for sustainable development
**SDG 1:** End poverty

**SDG 2:** Achieve food security

**SDG 3:** Healthy lives for all

**SDG 5:** Gender equality

**SDG 6:** Water for all

**SDG 7:** Energy for all

**SDG 11:** Cities safe and sustainable

**SDG 13:** Combat climate change

**SDG 15:** Protect terrestrial ecosystems

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### Actions to be taken

- Access and secure rights to productive land
- Changes in land use and cover, resulting in sustainable use
- Promoting sustainable agriculture and food systems
- Halting deforestation, land and soil degradation, and biodiversity loss
- Increased production and consumption of biomass for food, feed, fibre, and fuel

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**Basic soil biodiversity related ecosystem services that must be protected**

- Carbon cycle regulation and contribution to climate change mitigation
- Regulation of water supply and quality
- Biological population control and habitat support
- Nutrient provision and cycling for crop/forest growth and other ecosystems

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16 February 2016
SDGs explicitly mentioning soil:

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Target 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Target 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Target 15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world
Indicators proposed so far by the UNSC:

**Target 2.4** By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and **soil quality**.

*Proposed Indicator: Percentage of agricultural area under sustainable agricultural practices.*

**Target 3.9** By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and **soil pollution and contamination**.

*Proposed Indicator: Population in urban areas exposed to outdoor air pollution levels above WHO guideline values*

**Target 15.3** By 2030, combat desertification, restore degraded land and **soil**, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world

*Proposed Indicator: Percentage of land that is degraded over total land area.*
Target 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

→ Proposed Indicator: Soil Quality

Rationale:
The indicator is specifically linked to this target and explicitly mentioned in the target description. There is an extensive scientific and technical literature available documenting the development of a soil quality indicator. The indicator is currently operational within the OECD as one of the two agro-environmental indicators related to soils: soil erosion and soil quality. OECD countries are already regularly reporting on soil quality. See for example the regular reporting by the EU through EUROSTAT at http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_soil_quality
Agri-environmental indicator - soil quality

Data from July 2012. Most recent data: Further information, Main tables and Database. Planned update: October 2016.

This article provides a fact sheet of the European Union (EU) agri-environmental indicator soil quality. It consists of an overview of recent data, complemented by all information on definitions, measurement methods and context needed to interpret them correctly. The soil quality article is part of a set of similar fact sheets providing a complete picture of the state of the agri-environmental indicators in the EU.

The indicator provides an account of the ability of soil to provide agri-environmental services through its capacities to perform its functions and respond to external influences.

In the agri-environmental context, soil quality describes:
- the capacity of soil to biomass production;
- the input-need to attain optimal productivity;
- the soil-response to climatic variability;
- carbon storage, filtering, buffering capacity.

Main indicator
- Agri-environmental soil quality index

Supporting indicators
- Sub-indicator 1: Productivity index
- Sub-indicator 2: Fertiliser response rate
- Sub-indicator 3: Production stability index
- Sub-indicator 4: Soil environmental services index

Contents
[hide]
1 Main statistical findings
  1.1 Key messages
  1.2 Assessment
    1.2.1 Supporting indicator 1 - Soil productivity index

Map 1: Soil biomass productivity of croplands in the EU (expressed in relative terms with indices without measurement units), 2006, EU-27
Source: Joint Research Centre, European Commission
Target 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

→ Proposed Indicator: Progress in management of contaminated sites

**Rationale:**
The number of contaminated sites and progress made in their management and remediation is a key factor for achieving the proposed goal and specific target. Many countries in the world already have regular reporting systems on their contaminated sites. For example in Europe, regular reporting is managed by the European Environment Agency (see [http://www.eea.europa.eu/data-and-maps/indicators/progress-in-management-of-contaminated-sites-3/assessment](http://www.eea.europa.eu/data-and-maps/indicators/progress-in-management-of-contaminated-sites-3/assessment)).
Progress in the management of Contaminated Sites in Europe

Marc van Linden, Gundula Prokop, Sabine Rabi-Bergen, Mark Ribbensmith, Gwennal Louwagie
2014

Contaminated Sites

- remediated
- identified
- estimated total

sites x 1,000

Potentially Contaminated Sites

- already identified
- estimated total

sites x 1,000

12 February 2016
Target 15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world

1. Proposed Indicator 1: Trends in land/soil degradation
2. Proposed Indicator 2: Area of land/soils under sustainable management

Rationale:
Achieving a land degradation neutral world requires compensating on-going land degradation trends with equivalent land restoration activities. Soils are an integral component of land and the target explicitly call upon soil restoration activities. Sustainable Soil Management (SSM), as already recommended by the FAO Committee on Agriculture (COAG), should be a cornerstone of sustainable development. Therefore it should be explicitly included in the proposed indicators and further developed by the proposed working group on SSM to be established by FAO.
Voluntary Guidelines for Sustainable Soil Management (SSM)

- Definition of SSM
- Soil functions
  - Biomass production, including in agriculture and forestry;
  - Storing, filtering and transforming nutrients, substances and water;
  - Biodiversity pool, such as habitats, species and genes;
  - Physical and cultural environment for humans and human activities;
  - Source of raw materials;
  - Acting as carbon pool;
  - Archive of geological and archeological heritage.
- Threats to soil functions
  - Erosion, sealing, contamination, compaction, salinization, acidification, etc....
- Catalogue of good practices
- Case studies and demonstrations
Indicator 15.3.1: Trends in land degradation

Tier 1: Trends in land use/cover

Tier 2a: Trends in land productivity

Tier 2b: Trends in soil organic carbon stocks
• **Tier 1: Trends in Land Use/Cover.** This indicator is expressed in ha or km² or proportion of total land cover type and measure transitions from, *inter alia*, (1) natural and semi-natural land cover types (*e.g.*, forest, shrubs, grasslands, sparsely vegetated areas) to agricultural land and artificial surfaces (*e.g.*, urban, infrastructure, recreation), (2) agricultural land to artificial surfaces, and (3) agricultural land and artificial surfaces to natural and semi-natural land cover type.

• **Tier 2a: Trends in Land Productivity** (disaggregated by land use/cover type). These trends are calculated from long-term time series of remotely-sensed data on net primary productivity (NPP) at 1 km² spatial resolution and at 10 day intervals. An overview on the state-of-the-art methodologies is given by Yengoh et. al., 2014; Cherlet et al. 2014; Quang Bao Le et al., 2014.

• **Tier 2b: Trends in Soil Organic Carbon (SOC) Stocks** (disaggregated by land use/cover type). Baseline data on SOC are derived from version 1.1 of the Harmonized World Soil Database (HWSD) (FAO/IIASA/ISRIC/ISS- CAS/JRC 2009) and are expressed in tons per ha to a depth of 1m at a nominal spatial resolution of 1km (Scharlemann et al. 2009). The FAO’s Global Soil Partnership (GSP) is currently elaborating options for global measurements that would allow for the establishment of spatially distributed trends in SOC, estimated as a stock and expressed as mass (g C per ha) or content (% or g C/100 g of soil) for a reference depth.
The relevance of global soil organic carbon

During the CSA conference in March, the French Minister of Agriculture, Food and Forestry, Stéphane Le Foll announced public subsidies will be available for an international research project on the restoration of degraded soils and soil carbon sequestration.

He announced the establishment of an international research programme, the "4 per 1000", which aims to develop agricultural research to improve organic matter stocks in soil by four parts per 1000 per year.

A variation of −4‰ to +5‰ of this stock corresponds to −110 to +130 kg C/ha or −400 à +475 kg CO₂/ha

~800 -2.9 (4‰)
~800 +4.3 (5‰)
In top 0-30 cm
The 4 per mil target for soil carbon sequestration

(revisiting Balesdent & Arrouays, 1995 for France)
Global Soil Organic Carbon
Soil organic matter: multiple benefits

Soil Carbon

Food Security

UNCCD

Convention on Biological Diversity
REJOIGNEZ L’INITIATIVE
4 POUR 1 000

Les sols pour la sécurité alimentaire et le climat

En s’appuyant sur une documentation scientifique solide et des actions concrètes sur le terrain, l’Initiative « 4 pour 1 000 » vise à montrer que sécurité alimentaire et lutte contre les dérèglements climatiques sont complémentaires et à faire en sorte que l’agriculture apporte des solutions. Cette initiative consiste en une coalition d’acteurs volontaires dans le cadre du Plan d’action Lima Paris (PAA) soutenu par un programme de recherche ambitieux.

CALENDRIER
LES ÉTAPES À NE PAS MANQUER

- 16 septembre 2015 Conférence internationale sur l’agriculture et les sols agricoles face aux défis de la sécurité alimentaire et du changement climatique : politiques publiques et pratiques à l’OCDE
- 12-15 octobre 2015 Comité de la sécurité alimentaire mondiale à Rome – FAO
- 12-23 octobre 2015 COP12 de la Convention des Nations unies pour la lutte contre la désertification à Ankara

Chiffres clés

24% des sols mondiaux sont dégradés à des degrés divers, dont près de la moitié des sols agricoles [source : Bai et al., 2013]

1 500 milliards de tonnes de carbone dans la matière organique des sols mondiaux, plus de deux fois le carbone du CO₂ atmosphérique [source : GIEC, 2013]

1,2 milliards de tonnes de carbone par an, pourraient être stockées dans les sols agricoles (cultures et prairies) soit un taux annuel de stockage d’environ 4 pour 1 000 par rapport à l’horizon de surface du sol [source : GIEC, 2014]

24/40 millions de tonnes de grain supplémentaires pourraient être produits chaque année en Afrique, Asie et Amérique du Sud en stockant une tonne de matière organique par hectare [Lai, 2004]

1,2 milliards US $ de perte économique en grains liée à la dégradation des sols [FAO, 2006]
Thank you for your interest!

http://eusoils.jrc.ec.europa.eu/